Boston Children's Hospital

Microcephaly

Contact Us

Contact the Department of Neurology
617-355-6388

Fax
617-355-0284

International
+1-617-355-5209

Monday - Friday
7:00 AM - 8:00 PM

Saturday
9:30 AM - 6:00 PM

Listen

What is microcephaly?

When a child has microcephaly, the brain develops abnormally, causing the head to be much smaller than expected for the child's age. ("Micro" means "small," while "cephaly" comes from the Greek word for "head.") Some children with microcephaly have developmental problems or learning disabilities because of a smaller brain size. Microcephaly is relatively rare, though it is estimated that about 25,000 children in the U.S. are born with microcephaly each year.

Microcephaly is often **congenital** — meaning present at birth — but can also occur later during infancy. It can have several causes, from genetic problems to prenatal exposure to viruses such as Zika. For more information about the connection between the Zika virus and microcephaly, download **5 Things to Know About Microcephaly**.

While there is no specific treatment for microcephaly, early intervention (such as physical, speech, and occupational therapy) can help brain connections grow.

What are the signs and symptoms of microcephaly?

The main feature of microcephaly is a head size that is much smaller than normal for the child's age and gender.

Other signs and symptoms can vary widely from child to child. They can include:

- Poor weight gain and growth
- Poor appetite/feeding
- Difficulty with movement and balance
- Abnormal muscle tone (too loose, too tight)
- Speech delays
- Mild to severe learning disabilities

Some children with microcephaly also have other medical problems such as:

- Very short stature or dwarfism
- Facial deformities
- Seizures
- Vision and hearing problems
- Joint deformities (for example, in children with Zika infection)

What are the causes of microcephaly?

Microcephaly has a variety of causes. Knowing the cause is important in predicting what symptoms a child with microcephaly will have. For example, some forms of microcephaly are linked with severe developmental delay or a high risk for seizures, while others are not. Some forms can impair motor function or affect other organs in the body. Microcephaly linked to prenatal infections such as Zika sometimes causes with vision and hearing problems.

Microcephaly is often **congenital**, meaning a baby is born with the condition. In other cases, a baby can develop microcephaly after birth.

Causes of congenital microcephaly include:

- **Prenatal infections**: Exposure to the Zika virus, especially in the first trimester of pregnancy, can damage nerve cells in the brain. Other infectious agents can also cause microcephaly, including rubella (German measles), chickenpox, toxoplasma, and cytomegalovirus.
- **Genetic mutations**: Several hundred genes have been linked with microcephaly, and more are still being discovered. Defects in these genes can interfere with the brain's growth. In some cases, microcephaly may be related to Down syndrome or certain neurometabolic disorders.
- **Other causes during pregnancy**: There is evidence that alcohol and substance abuse, inadequate nutrition, untreated phenylketonuria (PKU) or exposure to toxic chemicals and certain prescription drugs during pregnancy can cause microcephaly in a baby.

Causes of microcephaly during infancy include:

- Genetic mutations
- Traumatic brain injury
- Lack of oxygen to the brain
- An infection in the brain

Diagnosis & Treatments

How is microcephaly diagnosed?

Doctors typically diagnose microcephaly by:

- Taking a full medical and family history
- Performing a complete physical exam
- Measuring the size of the baby's head as he or she grows, to compare with the average head size for age and gender
- Measuring the head size of the parents (sometimes smaller head sizes simply run in the family)

If your child has the congenital form of microcephaly — arising before birth — it might be possible to detect the condition with a **prenatal ultrasound** during the third trimester of pregnancy. Microcephaly is usually not obvious until the third trimester.

What testing is done for microcephaly?

If your child has microcephaly that involves some degree of learning disability or other impairment, your clinician may suggest one of the following tests:

- X-rays
- Computed tomography (CT) scan
- Magnetic resonance imaging (MRI) scan

If a genetic cause of microcephaly is suspected, your clinician may also suggest genetic testing.

Will my child with microcephaly be OK?

Your child's exact prognosis depends on his or her specific symptoms and circumstances. Keep in mind that head size doesn't always predict how a child will do.

While microcephaly cannot be cured, support and therapy can help new brain connections grow, even if the brain remains small. Even in the most severe cases, there are treatment options that can help your child feel and function better.

Can microcephaly be prevented?

When microcephaly is genetic, it cannot be prevented, but genetic counseling can be help you learn if the mutation is inherited and the likelihood that future children could be affected.

Those who live in or travel to areas where the Zika virus is common can prevent microcephaly by taking steps avoiding mosquito bites. Some health authorities suggest that women in Zika-affected areas postpone pregnancy until a Zika outbreak is contained.

Expectant mothers can also reduce the risk of having a baby with microcephaly by not using drugs or alcohol, eating a nutritious diet, and avoiding exposure to toxic chemicals and other viruses that can cause microcephaly.

How is microcephaly treated?

There is no cure for microcephaly, since there is no way to enlarge the brain and head. Instead, the treatment focuses on managing symptoms and any related conditions. Every child with microcephaly is different, so the type of support will be guided by his or her symptoms and severity of disease.

Children who don't have any problems other than a small head size will not need any treatment. Children who have problems with learning, speech or motor skills may benefit from:

- Physical therapy to help improve strength, movement, and coordination
- Occupational therapy to help build confidence performing day-to-day tasks
- Speech therapy to help improve language, voice, and swallowing skills
- Psychological counseling to help with self-esteem and feelings about their medical condition

Some children with severe microcephaly can have physical complications, such as seizures and facial deformities. These types of problems are treated separately.

How we care for microcephaly

Boston Children's Hospital has a long history of caring for children with brain and nervous system disorders. Clinicians in our **Department of Neurology**, **Department of Neurosurgery**, and **Division of Genetics and Genomics** are international leaders in understanding and treating rare conditions like microcephaly. Our **Fetal-Neonatal Neurology Program** and **Brain Development and Genetics Clinic** also specializes in diagnosing, studying, and managing microcephaly.

Our care also has a research component. Physicians and scientists in our Brain Development and Genetics Clinic are working hard to understand how and why microcephaly develops, in hopes of one day introducing new therapies. The clinic is actively enrolling patients to understand the effects of different genetic mutations that cause microcephaly.

- Call us at 617-355-6388
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- Request an appointment online

Programs & Services

Programs

Program

Brain Development and Genetics Clinic

The Brain Development and Genetics (BrDG) Clinic is a specialty consultation service that bridges the fields of neurology, cardiology, genetic counseling, and research.

Program

Care for Children with Medical Complexity

The Care for Children with Medical Complexity program strives to provide high quality of care across the continuum to more than 4,000 children with medical complexity.

Program

Cornelia de Lange Syndrome and Related Disorders Clinic

The Boston Children's Hospital Cornelia de Lange Syndrome and Related Disorders Clinic serves children with these developmental disorders.

Program

Epilepsy Center

The Epilepsy Center offers comprehensive diagnosis and care for children with epilepsy.

Program

Fetal-Neonatal Neurology Program

The Fetal-Neonatal Neurology Program provide comprehensive evaluations and treatment for babies who have experienced a brain injury or have a congenital neurological condition need intense, specialized care.

Departments

Department

Genetics and Genomics

The Division of Genetics and Genomics provides comprehensive clinical care including diagnostics, genetic counseling, and individualized management in concert with other specialties for people of all ages.

Department

Neurology

The Department of Neurology cares for infants, children, and adolescents with all types of neurologic and developmental disorders.

Department

Pediatric Occupational Therapy

The Department of Pediatric Occupational Therapy works with patients whose abilities are limited due to an injury, illness, or developmental issue.

The Department of Physical Therapy helps patients gain movement, strength, coordination, balance, and function.

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